Report Information
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Filtering image sequences corrupted by mixed noise using a new fuzzy algorithm.

Accession number & update
>   0009461681 20070603.

Conference information
>   2006 International Conference on Image Processing, Atlanta, GA, USA,
>   8–11 Oct. 2006.

Source
>   2006 International Conference on Image Processing, 1996, p. 4 pp., 11 refs, pp. CD–ROM, ISBN:
>   1–4244–0481–9. Publisher: IEEE, Piscataway, NJ, USA.

Author(s)
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Author affiliation
>   Saeidi, M., Moradi, M.H., Sagafi, F., Iran Telecommun. Res. Center, Univ. of Technol., Tehran, Iraq.

Abstract
>   In this paper, we will propose a novel fuzzy method in image sequences filtering. The proposed filter
>   assigns **adaptive** weights based on exponential membership functions and use **averaging** filter for
>   attenuating noise. Our proposed algorithm in image sequences filtering is much more better than the
>   previous algorithms, Specially if images are corrupted by mixed noise, our proposed method attenuates
>   noise and **preserves** edges much more better than the previous methods. Our proposed fuzzy algorithm
>   don't need estimating motion trajectory because their assigned weights to noisy pixels are **adaptive** and
>   use the correlation of pixels well enough. The proposed filter could remove mixed noise admissibly
>   without requesting to know Gaussian noise **variance** or salt & pepper noise density. It is shown
>   experimentally that the proposed filter can **preserve** image structures and edges under motion while
>   attenuating noise, and thus can be effectively used in image sequences filtering.

Descriptors
>   **ADAPTIVE–**FILTERS; FUZZY–LOGIC; IMAGE–DENOISING; IMAGE–MOTION–ANALYSIS;
>   IMAGE–SEQUENCES.

Classification codes
>   B6135 Optical–image–and–video–signal–processing*;
>   B6140B Filtering–methods–in–signal–processing;
>   C5260B Computer–vision–and–image–processing–techniques*.

Keywords
>   image–sequence–filtering; mixed–noise–corruption; fuzzy–algorithm;
>   **adaptive–**weight; exponential–membership–function; **edge–**preservation;
>   image–motion.

Treatment codes
>   P Practical;
>   T Theoretical–or–mathematical;
>   X Experimental.

Language
>   English.

Publication type
>   Conference–paper.

Availability
>   CCCC: 1 4244 0481 9/2006/$20.00.

Publication year
>   1996.

Publication date
>   19960000.

Edition
>   2007022.

Evaluating an adaptive windowing scheme in speckle noise MAP filtering.

Accession number & update

    0007510429 20070101.

Conference information

    Proceedings 15th Brazilian Symposium on Computer Graphics and Image
    Processing, Fortaleza–CE, Brazil, 7–10 Oct. 2002.
    Sponsor(s): Brazilian Comput. Soc.(SBC); Brazilian Nat. Council for
    Res.(CNPq); Brazilian Commission for Higher Educ.(CAPES).

Source

    Proceedings 15th Brazilian Symposium on Computer Graphics and Image Processing, 2002, p. 69–75,
    13 refs, pp. xvi+440, ISBN: 0–7695–1846–X. Publisher: IEEE Comput. Soc, Los Alamitos, CA, USA.

Author(s)

    Medeiros–F–N–S, Mascarenhas–N–D–A, Marques–R–C–P, Laprano–C–M. Editor(s):
    Goncalves–L–M–G, Musse–S–R.

Author affiliation

    Medeiros, F.N.S., DETI–UFC, Fortaleza, Brazil.

Abstract

    Synthetic aperture radar (SAR) images are corrupted by speckle noise, which degrades the quality and
    interpretation of the images. Speckle removal provides a better interpretability of SAR images if the
    technique performs the filtering without loss of spatial resolution and **preserves** fine details and edges.
    This work aims to redefine the neighborhood areas around the noisy pixel and in this area the local **mean**
    and **variance** are computed to estimate the Maximum a Posteriori (MAP) filter parameters. The proposed
    modified MAP algorithm improves the ability to filter the speckle noise without blurring edges and targets
    by applying the MAP estimator in the current **adaptive** window that is controlled by a measure of
    homogeneity in the area around the noisy pixel. This **adaptive** windowing was also incorporated to the
    classical Kuan et al. (1985) and Frost et al. (1982) filters in order to evaluate the performance of the
    proposed scheme. The effectiveness in reducing speckle by the modified MAP filter is evaluated in terms
    of qualitative and quantitative aspects such as line and **edge preservation** and the improvement of the
    signal to noise ratio. The tests were performed in real SAR images.

Descriptors

    FILTERING–THEORY; IMAGE–DENOISING; MAXIMUM–LIKELIHOOD–ESTIMATION;
    RADAR–IMAGING; SPECKLE; SYNTHETIC–APERTURE–RADAR.

Classification codes

    B6135 Optical–image–and–video–signal–processing*;
    B6140B Filtering–methods–in–signal–processing;
    B0240 Probability–and–statistics;
    C5260B Computer–vision–and–image–processing–techniques*;
    C1260S Signal–processing–theory;
    C1140 Probability–and–statistics.

Keywords

    adaptive–windowing–scheme; speckle–noise–MAP–filtering; synthetic–
    aperture–radar–images; image–interpretation; spatial–resolution;
    Maximum–a–Posteriori–filter–parameters; modified–MAP–algorithm;
    performance; **edge**–preservation; **line**–preservation; signal–to–noise–
    ratio; SAR–images.

Treatment codes

    T Theoretical–or–mathematical;
    X Experimental.

Language

    English.

Publication type

    Conference–paper.

Availability
> CCCC: 1530–1834/02/$17.00.

Digital object identifier
> 10.1109/SIBGRA.2002.1167126.

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A hybrid sigma filter for unbiased and edge–preserving speckle reduction.

Accession number & update
> 0005119223 20070101.

Conference information
> 1995 International Geoscience and Remote Sensing Symposium, IGARSS
> '95. Quantitative Remote Sensing for Science and Applications,
> Firenze, Italy, 10–14 July 1995.
> Sponsor(s): IEEE Geosci. & Remote Sensing Soc; URSI.

Source
> 1995 International Geoscience and Remote Sensing Symposium, IGARSS '95. Quantitative Remote
> Sensing for Science and Applications (Cat. No.95CH35770), 1995, vol.2, p. 1409–11 vol.2, 7 refs, pp. 3
> vol. lxvi +2331, ISBN: 0–7803–2567–2. Publisher: IEEE, New York, NY, USA.

Author(s)
> Alparone–L, Baronti–S, Garzelli–A. Editor(s): Stein–T–I.

Author affiliation
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Abstract
> An enhanced version of Lee's sigma filter is derived and proposed for unbiased filtering of images
> affected by multiplicative noise with speckle statistics. Instead of the plain point value, a more accurate
> start value is first produced, and then fed to the procedure of conditional **average.** A robust estimate of
> the nonstationary **mean** is defined according to a decision rule borrowed from the FIR–median hybrid
> filters, thus improving the performance also for impulsive noise. The start value is provided by a nonlinear
> decision rule aimed at rejecting noise spikes, which is undertaken on the **averages** computed within four
> isotropically balanced pixel sets able to capture step edges and thin lines. The level range of pixels to be
> **averaged,** adaptively defined as the product of the space–variant **mean** estimate by the constant noise
> **variance,** is also forced to account for the imbalance of the noise distribution, for unbiased processing.
> Comparison tests performed on images affected by synthetic speckle, simulating both one–look and
> multi–look statistics, show significant improvements over the basic scheme, as well as over Kuan's and
> geometric filter, resulting in lower distortion between noise–free and processed images. Also visual
> comparisons on a true NASA/JPL AIRSAR image, establish the superiority of the novel scheme.

Descriptors
> DIGITAL–FILTERS; GEOPHYSICAL–SIGNAL–PROCESSING; GEOPHYSICAL–
> TECHNIQUES; RADAR–IMAGING; REMOTE–SENSING–BY–RADAR; SPECKLE;
> SYNTHETIC–APERTURE–RADAR.

Classification codes
> A9385 Instrumentation–and–techniques–for–geophysical–hydrospheric–and–
> lower–atmosphere–research*;
> A9190 Other–topics–in–solid–Earth–physics;
> A9365 Data–and–information–acquisition–processing–storage–and–

dissemination–in–geophysics;
B7710 Geophysical–techniques–and–equipment*;
B7730 Other–remote–sensing–applications–in–Earth–sciences;
B6320 Radar–equipment–systems–and–applications;
B6140C Optical–information–image–and–video–signal–processing.

Keywords

geophysical–measurement–technique; radar–remote–sensing; radar–
imaging; speckle–reduction; image–processing; synthetic–aperture–
radar; SAR–imaging; hybrid–sigma–filter; **edge**–preserving–speckle–
reduction; Lee; Lee's–sigma–filter; unbiased–filtering;
multiplicative–noise; start–value; decision–rule; noise–spike–
rejection; land–surface; terrain–mapping; AIRSAR.

Treatment codes

P Practical;
T Theoretical–or–mathematical.

Language

English.

Publication type

Conference–paper.

Availability

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Publication year

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Compared performances of morphological, median type and running mean filters.

Dialog eLinks

Full text options DSTO Full Text Retrieval Options

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0004510375 20070101.

Conference information

Visual Communications and Image Processing '92, Boston, MA, USA, 18–20
Nov. 1992.
Sponsor(s): SPIE.

Source

Proceedings of the SPIE – The International Society for Optical Engineering,
{Proc–SPIE–Int–Soc–Opt–Eng–USA}, 1992, vol. 1818, p. 384–91, 13 refs, CODEN: PSISDG, ISSN:
0277–786X, USA.

Author(s)

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Author affiliation

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Abstract

Very simple output distribution expressions of erosions and openings are given for independent
non–identically distributed inputs. The output meas ad **variances** for input signals plus white Gaussian,

bi– exponential, and uniform noises are analyzed and computed. These results are used to compare the performances of morphological filters with those of median filters, alpha–trimmed **mean** filters, randed–order filters and running **mean** filters. The comparisons show that morphological filters achieve the best **edge preservation** for all three kinds of noises. morphological filters are the best for uniform noise, median filters are optimal for bi–exponential noise, and running **mean** filters for Gaussian noise. Performances of alpha–trimmed **mean** filters spread between those of media ad linear filters, while performances of ranked–order filters are compromises between those of erosions (or dilation) and median filters.

Descriptors
FILTERING–AND–PREDICTION–THEORY; IMAGE–PROCESSING; MATHEMATICAL–MORPHOLOGY; NOISE; VARIATIONAL–TECHNIQUES.

Classification codes
B6140C Optical–information–image–and–video–signal–processing*;
C1250 Pattern–recognition*.

Keywords
alpha–trimmed–mean–filters; image–processing; output–distribution;
independent–non–identically–distributed–inputs; **variances;**
performances; **edge–**preservation; morphological–filters; uniform–noise;
median–filters; bi–exponential–noise; **running–**mean–filters; Gaussian–noise; ranked–order–filters.

Treatment codes
T Theoretical–or–mathematical.

Language
English.

Publication type
Conference–paper; Journal–paper.

Availability
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Publication year
1992.

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On edge preservation in multiresolution images.

Dialog eLinks
Full text options   USPTO Full Text Retrieval Options

Accession number & update
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Source
CVGIP: Graphical Models and Image Processing, {CVGIP–Graph–Models– Image–Process–USA}, Nov. 1992, vol. 54, no. 6, p. 461–72, 19 refs, CODEN: CGMPE5, ISSN: 1049–9652, USA.

Author(s)
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Abstract
Multiresolution image processing and analysis has become popular in recent years. One of the most important factors for the success of such systems is the **preservation** of edges in the process of

producing images with reduced resolutions. Ten image reduction methods are introduced and a comparative evaluation is presented by using a set of synthetic test images and several real images. The quantitative evaluation employs an error measure based on normalized **mean–**square errors and a set of well–defined image parameters. The **edge** separation parameter is found to have a strikingly decisive impact on **edge preservation** in the context of image reduction. Noise and **edge** width also show their significant effects. A normalized local intensity **variance** is studied to bridge the gap between the simple synthetic images and the real images. Finally, suitable methods for producing multiresolution images are recommended.

Descriptors

    EDGE–DETECTION.

Classification codes

    B6140C Optical–information–image–and–video–signal–processing*;

    C1250 Pattern–recognition*;

    C5260B Computer–vision–and–image–processing–techniques.

Keywords

    multiresolution–image–processing; multiresolution–image–analysis; **edge–**preservation; image–reduction; synthetic–test–images; real–images; error–measure; **normalized–**mean–square–errors; image–parameters; **edge–**separation; **edge–**width; normalized–local–intensity–**variance.**

Treatment codes

    T Theoretical–or–mathematical.

Language

    English.

Publication type

    Journal–paper.

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Search Strategy

No.	Database	Search term	Info added since	Results
1	INZZ	edge ADJ (preserv$5 OR adaptive)	unrestricted	1370
2	INZZ	edge–preserv$5 OR edge–adaptive	unrestricted	414
3	INZZ	1 OR 2	unrestricted	1370
4	INZZ	edge ADJ (preserv$5 OR adaptive) OR edge–preserv$5 OR edge–adaptive	unrestricted	1370
5	INZZ	(mean OR averag$3) AND varianc$2	unrestricted	16372
6	INZZ	3 AND 5	unrestricted	27

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